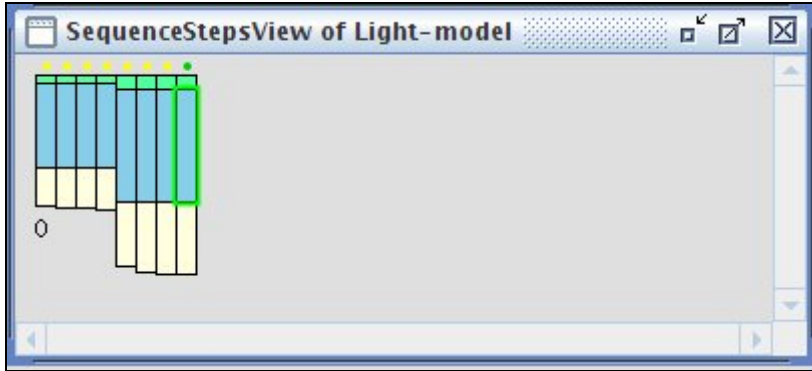


Viewing a Planning Sequence Using PlanWorks

To get started, open a loaded *Planning Sequence* from the **Planning Sequence** menu. This brings up the *SequenceStepsView*:



This is a histogram of the partial plan data base size for each step of the sequence, with every tenth step number displayed at the bottom of the appropriate element.

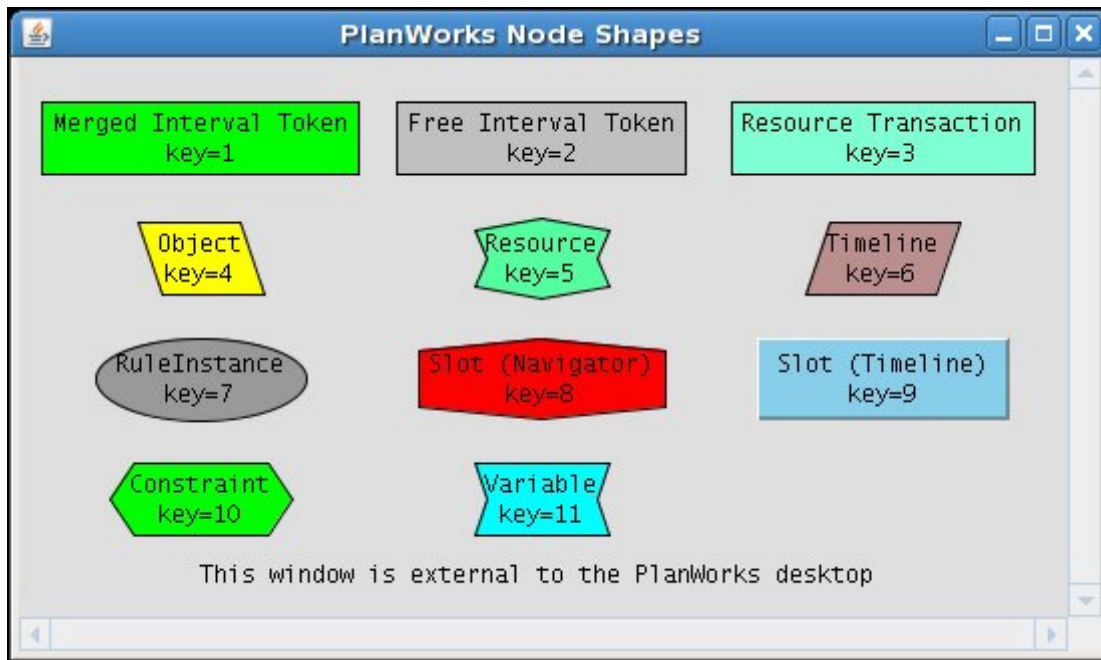
Individual or all partial plan views for each step are available by clicking Mouse-Right on the desired step in the histogram (*SequenceStepsView*). This step then becomes the currently selected step. The histogram steps have a "mouse over" pop-up showing the step number, and the data base size for tokens, variables, and constraints -- which are color coded.

Above each histogram step in the *SequenceStepsView* is a colored dot: green - partial plan loaded into data base; yellow - partial plan on disk; and red - partial plan not on disk.

Partial Plan Views

The available partial plan views are listed below. In each, the key values for interval tokens, resource transactions, constraints, variables, timelines, resources, objects, rule instances, and slots appear in the appropriate node labels of the partial plan views.

The rendered node shapes are (which can be generated by selecting **Help -> Node Shapes**) are shown here:



All partial plan views' Mouse-Right pop-ups offer the user selections (*Open <view-name> View*) for the other partial plan views, which will create them as needed. All views, except the Resource Profile View and Resource Transaction View also offer *Raise Content Filter*, which will set focus on the appropriate partial plan Content Filter window. In addition, all partial plan view's Mouse-Right pop-ups offer the user *Close All Views*, *Hide All Views*, *Open All Views*, *Show All Views*, *Step Backward All Views*, and *Step Forward All Views*.

Applying a Content Filter specification will cause the views to be redrawn with only the filtered predicates, timelines, time intervals, and their dependencies.

Every view (except the *SequenceStepsView* has two buttons in the lower left corner which, when clicked, will cause the view to display either the next or previous step. The highlighted step in the *SequenceStepsView* will track the current step number.

Available Views

The following pages overview some of the things you can see and do in each of the available views (as mentioned above, any view can be obtained by right-clicking in an existing view):

- **Constraint Network View:** An incrementally built directed graph of objects, resources, timelines, interval tokens, resource transactions, rule instances, their variables and their constraints
- **Resource Profile View:** View each resource's min/max profiles and min/max limits with the x-axis being time and the y-axes being the resource quantity.
- **Resource Transaction View:** View each resource's transactions stacked vertically by their time intervals when they overlap.
- **Temporal Extent View:** View all predicates on a time scale with ranges for *start* and *end* variables.
- **Timeline View:** View plan's objects timelines and slots.
- **Token Network View:** View token relations and rule instances in a directed graph.

Node Focus in Views

Nodes for which focus can be set:

- Interval token nodes in the Constraint Network, Temporal Extent, Timeline (slot nodes), and Token Network views;
- Resource transactions in the Resource Transaction, Temporal Extent, and Token Network views;
- Resource nodes in the Resource Profile, and Resource Transaction views.

These nodes have a Mouse-Right pop-up menu with the possible selection of "Set Active Token". When the "active token" has been set, the other views have a "background" Mouse-Right pop-up menu with the possible selection of "Snap to Active Token". Making this selection will cause the view to scroll to a position where the "active token" will be shown, highlighted, in the approximate center of the view. A Mouse-Left click in any view will erase node selection highlighting. In the *Timeline View*, clicking Mouse-Right "Set Active Token" on a slot, will set the overloaded tokens as "secondary tokens", such that when Mouse-Right "Snap to Active Token" is invoked in the background of the *Constraint Network View*, the *Temporal Extent View*, or the *Token Network View*, these secondary tokens will be given secondary highlighting (turquoise). The base token will have the primary highlighting color (light green).

In all the partial plan views, Mouse-Right on the background offers "Find by Key" which allows the user to enter a key and have the view scroll to that node's location. For the different views, entered keys will find:

- *Temporal Extent* and *Token Network* views: interval token and resource transaction nodes.
- *Timeline View*: timeline, interval token, and slot nodes.
- *Resource Profile View*: resource profiles
- *Resource Transaction View*: resources and resource transactions.
- *Constraint Network View*: object, timeline, resource, token, variable, and constraint nodes -- opening appropriate connecting nodes, if needed.

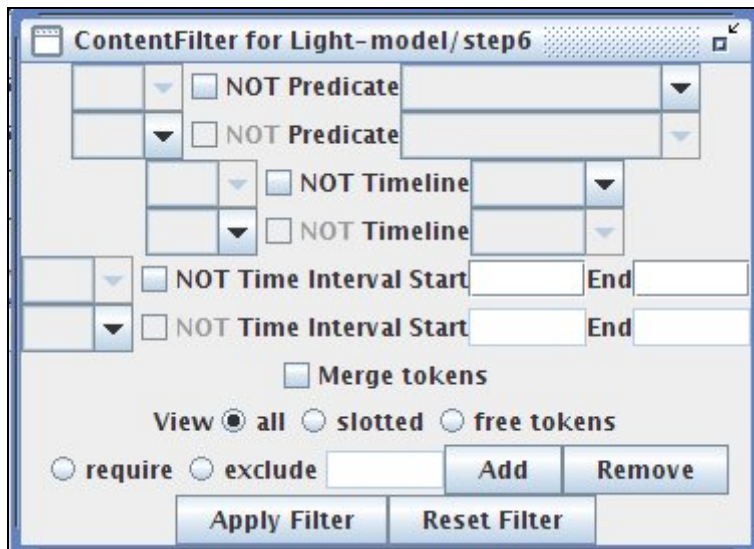
Entity Relationships

For all nodes, except empty slots, there is a Mouse-Right selection "Open Navigator View" which allows navigation through all relationships in the partial plan data base, beginning with the selected entity. See this *Navigator View* [example](#).

In addition to the "standard" selections, the Navigator View has three background Mouse-Right selection options: "Find by Key", "Find Entity Path", and "Highlight Current Path". "Find by Key" requests a single entity key and finds that node, opening it and its neighbors, if necessary. "Find Entity Path" requests two entity keys, class node types to search, and an optional maximum path length. "Find Path" finds a path through the classes specified, rendering the selected nodes and highlighting them. This dialog also offers "Does Path Exist" which determines whether a path exists, without finding the nodes. Selected nodes are dragged as a group, which may be inconvenient. To deal with this, click Mouse-Left in the background to discard the selections, drag the nodes to new locations, and then on the background select Mouse-Right: "Highlight Current Path".

Content Filtering

The tokens displayed in the partial plan views may be filtered by predicate, by timeline, by time interval, and/or by token keys using the partial plan's Content Filter dialog:



It is also possible to limit the set of valid tokens to only free tokens ("View free tokens"), to only slotted tokens ("View slotted tokens"), to only base tokens ("Merge tokens" and "View slotted tokens"), or to free and base tokens ("Merge tokens").

Applying single predicate, timeline, and time interval filters results in only the tokens which match that filter being displayed. To filter "in" more than one of the types, use the "OR" combo box selection; to filter "out" more than one of the types, use the "NOT" check box for each entity type, and the "AND" combo box selection

The token keys filter works thusly: click on either the "require" or "exclude" radio button, and then enter the key value in the input slot. To include more keys, click on "Add"; to remove keys from a previous "Apply Filer" set, click on "Remove". The "require" or "exclude" selections override the "Predicate", "Timeline", and "Time Interval" selections, with applied together.

Selections applied from this dialog result, internally, in a set of valid tokens, which are used by the views to filter their displays.

The Content Filter window's background areas offer Mouse-Right selections for opening individual or all partial plan views, and for "stepping" all active views.